

ANNUAL INDEX OF ARTICLES: 1•9•9•5

ADMIXTURES

High-Reactivity Metakaolin: Discusses a field study showing that this new mineral admixture boosts concrete compressive strength while maintaining concrete workability and finishability. (4 pp; 95:604)

How Do Admixtures Influence Shrinkage? Two members of the concrete industry, each from a different sector, address whether the use of admixtures in concrete mixes will increase, decrease, or fail to affect the drying shrinkage of concrete. (7 pp; 95:611)

How Mid-Range Water Reducers Enhance Concrete Performance: Tells how these new admixtures influence water content, slump, and strength and provide faster concrete pumping and placement; predictable, consistent set times; improved workability at a given slump; and improved surface slickness to facilitate the finishing process. (3 pp; 95:599)

AIR ENTRAINMENT

Investigating Effects of Concrete Handling on Air Content: Study evaluates air loss in fresh concrete due to a variety of handling methods, including pumping, to determine how air content, air-void system parameters, and freeze-thaw durability of air-entrained concrete are affected by placement and consolidation methods. (4 pp; 95:745)

ARCHITECTURAL CONCRETE

Specifying Architectural Cast-In-Place Concrete: Tells architects and engineers that mock-ups and careful planning of formwork, joints, corners, concrete placement, form removal, texturing, and repairs are essential to achieving quality architectural concrete. (4 pp; 95:367)

BARRIER WALLS

Overcoming All Barriers: Details the benefits of using multipurpose pavers to place concrete median barriers—

sometimes to heights exceeding 6 feet. (5 pp; 95:515)

BASEMENTS

French Drains Help Keep Residential Basements Dry: Tells how to install this simple but effective system that diverts groundwater from foundations; drainage system consists of an underground trench filled with loose stones or rubble surrounding a perforated PVC pipe. (4 pp; 95:550)

Waterproofing Options for Concrete Foundations: Provides an overview of waterproofing products and gives tips for using each of the following options: liquid membranes; cementitious products; hot-mopped, asphalt-and-felt built-up systems; and sodium bentonite. (6 pp; 95:675)

BRIDGES

Casting Box Girder Segments: Describes how casting yards fabricate bridge segments using long-line, short-line, and match-casting methods. Tells of the importance of positioning rebar, post-tensioning ducts, and hardware; placing, finishing, and curing concrete; and striking forms. (5 pp; 95:68)

Chesapeake & Delaware Canal Bridge: Profiles the construction of the 4,650-foot-long, cable-stayed C & D Canal Bridge, the first major precast concrete segmental bridge in the Northeast. (5 pp; 95:739)

Pumping a Concrete Bridge from a River Barge: Describes the balanced cantilever construction of the cast-in-place Acosta Bridge over the St. Johns River in Jacksonville, Fla., which required river barges—both to transport ready mix trucks and to provide a platform from which to pump concrete. (6 pp; 95:276)

Reducing Transverse Cracking in New Concrete Bridge Decks: Study for the National Cooperative Highway Research Program finds that contractors can minimize bridge deck cracking by paying careful attention to concrete

mix design, temperature control of concrete during and after placement, and placing, finishing, and curing practices. (3 pp; 95:735)

BUILDING CODES

Proposed Changes to ACI Building Code for Reinforced Concrete: Outlines some of the proposed revisions of ACI Committee 318, focusing on the changes most likely to affect concrete contractors, such as new responsibility for developing shoring and reshoring plans and schedules for multistory construction. (3 pp; 95:390)

COLD-WEATHER CONCRETING

Keep Your Cool When Cold-Weather Concreting: Tells contractors how to adjust their preplacement, placement, and postplacement procedures to accommodate cold-weather concrete's slower set times and strength-gain rates. (5 pp; 95:917)

COLORING CONCRETE

Coloring Concrete with Stains and Sealers: Distinguishes stains from colored sealers: Stains simply color hardened concrete while colored sealers both color and protect it. Also discusses how to best apply each of these coloring agents. (5 pp; 95:925)

Contractor's Checklist for Quality Control of Integrally Colored Concrete Flatwork: Provides contractors with guidelines for all stages of a project, from planning to completion, to help them achieve permanent, uniform, streak-free color with agents such as color-conditioning admixtures. (3 pp; 95:372)

CONCRETE CANOES

Concrete Canoes Paddle It Out on the Potomac: Profiles the winners of the eighth annual American Society of Civil Engineers' National Concrete Canoe Competition, sponsored by Master Builders Inc. (5 pp; 95:771)

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CONSOLIDATION

Vibrating Concrete in Wall Forms: Provides internal vibrating techniques that result in strong, dense concrete with fewer surface defects. (3 pp; 95:180)

DESIGN

PCA Announces 1994 Concrete Building Competition Winners: Details the five winners of the 1994 Concrete Building Awards, sponsored by the Portland Cement Association. Photos of these award-winning projects illustrate the use of concrete as a sculptural, structural, and unifying design element. (2 pp; 95:380)

FINISHING

Don't Brush Off Broom Finishing: Discusses how to choose, use, and maintain finishing brushes for concrete flatwork. (4 pp; 95:1025)

FLOORS

Ice Rink Floor Placed in One Pour: Tells how contractor placed a 202x102-foot, 8-inch-thick concrete slab monolithically using two pumps while meeting requirements for a flat, level surface with no joints. (2 pp; 95:472)

Pan Floats Help Make Nestle's Floors Sweet: Concrete floor contractor tells how attaching pan floats to ride-on, nonoverlapping power trowels increased F-numbers on a 700,000-square-foot project. (4 pp; 95:439)

Ten Steps to Placing Flat Floors: Outlines ten proven procedures for meeting floor flatness and levelness specifications, helping contractors meet ASTM E 1155. Photos illustrate nine of the 10 steps. (3 pp; 95:446)

Understanding Specifications for Superflat Floors: Warns contractors to beware of the different specifications for random-traffic floors (F-number system) and superflat, or defined-traffic, floors (F_{min} measurements) while providing them with some common specifications errors to avoid. (4 pp; 95:591)

FORMING

Advances in Vertical Slipform Construction: Discusses how improved yoke designs and laser controls have resulted in more economical construction and faster slipping speeds. (4 pp; 95:824)

Custom Forms Enhance Bridge Pier Design: Describes how reusable, custom cap forms and standard, rusticated column forms provided arches and rustications on cast-in-place concrete piers for a bridge over the Tolomato River in Vilano Beach, Fla. (2 pp; 95:378)

Forming Bridge Pier Shafts: Tells how contractors can use job-built wood systems, steel systems, and combinations of the two to form the following bridge pier shapes: obrounds, elongated octagons, and elongated hexagons. Traditionally used for river crossings, these bridge pier shafts are both functional and aesthetically pleasing. (4 pp; 95:729)

Forming System Speeds Elevated-Slab Construction: Describes how a unique hand-set, aluminum slab-forming system designed for quick, safe installation and removal helped a concrete formwork subcontractor meet a tight eight-week schedule for construction of approximately 300,000 square feet of elevated office-building slabs. (2 pp; 95:836)

Selecting and Using Plywood Forming Panels: Tells contractors that to use the best structural wood forming panels for each job, they should evaluate the various plywood types, classes, grades, and overlays (medium-density, high-density, or proprietary). (5 pp; 95:817)

Stay-In-Place Wall Forms Revolutionize Home Construction: Explains the benefits of stay-in-place, extruded polystyrene forms, provides an overview of the two types of forming systems available (panel or grid), and offers building tips that range from erecting the forms to installing plumbing and wiring. (5 pp; 95:12)

HISTORY

Alcatraz: Concrete on "The Rock": Gives the history of this historic reinforced-concrete prison built in the early 1900s and details what work is required to restore the cell house. (4 pp; 95:207)

Roads of the Roman Empire: Describes the ancient Roman road-building technology that produced thick, durable concrete roadways and compares it to the U.S. and European paving practices of today. (5 pp; 95:949)

LIGHTWEIGHT CONCRETE

Structural Lightweight Aggregate Concrete: Discusses lightweight aggregate characteristics, prewetting processes, field tests, and adjustments, as well as procedures for handling lightweight aggregate concrete on the job. (5 pp; 95:618)

LUNAR CONCRETE

Taking Concrete to the Outer Limits: Describes the mixing and curing processes of the first portland-cement-based mortar produced in the microgravity conditions of outer space (on board the space shuttle Endeavour). (4 pp; 95:855)

MANAGEMENT

How Concrete Contractors Deal with Government Regulations: Contractors find that adhering to government regulations, including safety and quality inspections, helps them deliver a better product at a lower cost. (3 pp; 95:34)

Protecting Construction Equipment from Vandalism and Theft: Presents simple, effective security measures contractors can implement to protect equipment that is often stored on the jobsite, such as formwork, heavy machinery, and hand tools. (3 pp; 95:938)

Raising Prices without Fear: Tells concrete contractors how to tell when their prices are too low and how to avoid making a pricing error (particularly underpricing). (2 pp; 95:44)

Staying Competitive in a Changing Market: Provides contractors with the information they need to identify and then meet changing customer preferences. Includes tips on how to improve communication with employees as well as existing and potential customers. (3 pp; 95:48)

MATERIAL HANDLING

Handling Concrete on Small Pours: Describes how equipment such as chute attachments, wheelbarrows, carts, motorized buggies, skid-steers, conveyors, and small-line pumps can move concrete economically and efficiently on small jobs. (5 pp; 95:168)

Transporting Basement Wall Forms with Ease: Tells how contractors can prevent form damage and save time and effort by using truck-mounted cranes to lift and carry large form panels. (5 pp; 95:174)

(continued)

NOTABLE PROJECTS

Diversion Channel Helps Arizona Canal Control Flooding: Describes the award-winning construction of a cast-in-place concrete diversion channel that was formed with a customized traveling forming system. (6 pp; 95:462)

Huge Warehouse Built with Concrete: Tells how Amway Corp.'s 650,000-square-foot warehouse/distribution center in Ada, Mich. (featuring a steel-fiber-reinforced concrete floor) was built on time and on budget. (5 pp; 95:185)

Improving Flood Control along the Orleans Avenue Canal: Describes the challenging construction of a reinforced-concrete floodwall, 2,259 lineal feet long and 17½ feet high, for which contractor T.L. James earned a performance award from the New Orleans District of the U.S. Army Corps of Engineers. (4 pp; 95:23)

PARKING STRUCTURES

Designing and Building Durable Parking Structures: Urges designers and contractors to consider issues such as concrete cover over reinforcement, concrete mix design, drainage, and construction practices to minimize the effects of freezing weather, deicing salts, and traffic on concrete parking garages. (8 pp; 95:263)

PAVING

"Forty-day Wonder" Sets Precedent for Airport Pavements: Describes the 40-day construction of a concrete runway built in 1969 for Atlanta's Hartsfield International Airport. The runway continues to provide excellent service, and in 1994 its builders earned a lifetime achievement award for outstanding pavement performance from the American Concrete Pavement Association. (4 pp; 95:76)

Smooth Paving for 1995 ACPA Award Winners: Showcases the winners and runners-up of the sixth annual National Awards Program for Excellence in Concrete Pavement, sponsored by the American Concrete Pavement Association and *Concrete Construction*. The panel of judges also recognized the team of contractors and engineers responsible for Chicago's reconstruction of the John F. Kennedy expressway. (5 pp; 95:1009)

Understanding Slipform Pavers: Showcases the components of modern slipform pavers and tells how these complex machines still rely on the standard tools of the trade to strike off, consolidate, and finish concrete. (6 pp; 95:521)

PROBLEM CLINIC

January (3 pp; 95:88)

- Diamond Blade Cuts Too Slowly
- Expansion Joints Not Needed in Sidewalk
- Where to Remove Cores When Investigating Low Cylinder Strengths
- Floor-Flatness Number Conversion

February (1 p; 95:215)

- Preventing Bugholes
- Protecting Shotcrete from Freezing

March (2 pp; 95:315)

- Finishing Steel-Fiber-Reinforced Concrete
- R-Value of Concrete

April (2 pp; 95:396)

- Plastic Shrinkage Crack Prediction
- Tolerances for Footings

May (2 pp; 95:474)

- Expansion Joints Prevent Buckling of Cart Paths
- Producing a Rock-Salt Finish

June (1 p; 95:559)

- Elevated-Slab Thickness Tolerance

July (1 p; 95:625)

- Use of Shrinkage-Compensating Concrete

August (1 p; 95:691)

- What's a Burnished Slab?
- Coating a Floor That Contains Fiber Reinforcement

September (1 p; 95:778)

- Forming Curved Walls

October (2 pp; 95:860)

- Air-Content Specifications for Exterior Flatwork

November (1 p; 95:954)

- What Causes Dark Patches on Tilt-Up Panels?

December (2 pp; 95:1030)

- Differences between Wet, Moist, and Damp Subgrades.
- When to Saw Control Joints

REINFORCING STEEL

Bending Rebar on the Job: Profiles the features and operation of various portable and manual rebar benders—ranging from hand-held tools to wheel-mounted machines—which allow contractors to produce rebar hooks or stirrups on-site whenever they're needed. (4 pp; 95:684)

Choosing Supports for Welded Wire Reinforcement: Discusses the supports available to ensure proper positioning of welded wire reinforcement in slabs

on grade and provides tips for choosing the best support for each jobsite's conditions. (3 pp; 95:831)

Mechanical Rebar Splicing Systems for Cast-In-Place Concrete Structures: Provides an overview of tension-compression splicing systems and tells how using mechanical connections properly can increase structural integrity as well as jobsite productivity and safety. (7 pp; 95:450)

RESIDENTIAL CONSTRUCTION

Concrete Home Won't Blow Down: Describes how a Florida contractor built an all-reinforced-concrete, hurricane-proof home in Homestead, Fla., site of the devastating 1992 Hurricane Andrew. (4 pp; 95:932)

How to Build Concrete Homes Using Foam Forms: Provides tips—ranging from planning and design to selecting wall finishes—on how to use one type of stay-in-place, expanded polystyrene block form. (7 pp; 95:659)

Warranties for Concrete Driveways: Profiles the success of the national Blue Ribbon Driveway program, which guarantees high-quality concrete driveways by teaming contractors with ready mix suppliers, regional concrete promotion associations, the Portland Cement Association, the National Ready Mixed Concrete Association, and the American Society of Concrete Construction. (4 pp; 95:669)

ROCK FORMATIONS

Creating Concrete Rock and Waterscapes: Describes two types of artificial rock—positive rock and cast rock—and outlines how rock and waterscapes have enhanced San Francisco's Golden Gate Park and provided an aesthetically pleasing substitute for eroding cliffs in Malibu, Calif. (2 pp; 95:375)

SAFETY

Top OSHA Violations and How to Avoid Them: Lists the top eight OSHA physical hazards in construction and suggests abatements. (3 pp; 95:30)

SAFETY BASICS

January (1 p; 95:11)

- Personal Protective Equipment

February (1 p; 95:167)

- Fall Protection

March (1 p; 95:249)

- Electrical Safety

April (1 p; 95:361)

- Ladder Safety

May (1 p; 95:437)

- Scaffold Safety Checklist

June (1 p; 95:513)

- Power Tool Safety

July (1 p; 95:589)

- Reinforcing-Steel Safety

August (1 p; 95:657)

- Concrete Placement Safety

September (1 p; 95:727)

- Formwork Safety Checklist

October (1 p; 95:815)

- Concrete Boom-Pump Safety

November (1 p; 95:899)

- Erecting Precast/Prestressed Concrete Safety

December (1 p; 95:1007)

- Flagger Safety

SAWING

Sawcutting Joints in Concrete: Explains why sawcut joints are needed and tells where, when, and how to make them. (7 pp; 95:54)

SHOTCRETE

Shotcreting Underground: Describes

techniques for shotcreting tunnels and mines, most of which now use shotcrete as both a major element of support during excavation and as part of the lining system. (4 pp; 95:909)

Using Concrete Pumps for Shotcreting: Discusses how small, medium, and large concrete pumps can be used for wet-shotcreting as well as normal concrete pumping and reminds readers that wet-shotcreting requires many of the same considerations as concrete pumping. (4 pp; 95:901)

SOIL COMPACTION

Walk-Behind Plate Compactors: Describes the components and operation of walk-behind vibratory plate compactors, which are ideal for compacting granular material such as uniform sands and gravels, especially in confined areas. (4 pp; 95:542)

TILT-UP


Guidelines for Bracing Tilt-Up Walls: Pictorial feature shows dos and don'ts for bracing concrete wall panels. Covers choosing the proper system, anchoring the braces, and installing the bracing system. (2 pp; 95:1019)

1995 Tilt-Up Achievement Award Winners: Details the six winners of this competition, sponsored by the Tilt-Up Concrete Association. Contest criteria included quality of construction, aesthetic appeal, creativity of structural and architectural design, efficiency of material utilization, suitability of the building to its environment, and unique application or end use. (3 pp; 95:384)

Tilt-Up Goes Upscale: Demonstrates that demand for tilt-up is growing because building owners can choose from more design options and concrete finishes, including exposed aggregate and textured patterns. (3 pp; 95:363)

WHITETOPPING

Whitetopping Restores Air Traffic at Spirit of St. Louis: Profiles the whitetopping of a U.S. airport's 6-acre asphalt apron, which required a 10-inch-thick concrete overlay for heavy loads, an 8-inch-thick overlay for medium loads, and an ultra-thin overlay (less than 4 inches thick) for light loads. Project marked the first use of an ultra-thin overlay by a U.S. airport. (6 pp; 95:532)



FACTS ON WELDED WIRE REINFORCEMENT AND FIBERS

Synthetic and Steel Fibers Are Not Concrete Reinforcement

Codes & Guides Specifying Concrete Reinforcement

	WWR	Fibers
ACI 318 Approves.....	Yes	No
ACI 301 Approves.....	Yes	No
ACI 302 Approves.....	Yes	No
ACI 360 Approves.....	Yes	No
ANSI/ASCE 3-91 - Design of Composite Slabs Approves.....	Yes	No
ANSI/ASCE 9-91 - Construction of Composite Slabs Approves.....	Yes	No

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